NON-PUBLIC?: N
ACCESSION #: 9005160071
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Turkey Point Unit 4 PAGE: 1 OF 04

DOCKET NUMBER: 05000251

TITLE: Unit Trip Due To Under Frequency Relay Failure
EVENT DATE: 04/09/90 LER #: 90-003-00 REPORT DATE: 05/08/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: David R. Powell, Licensing TELEPHONE: (305) 246-6559
Superintendent

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: AB COMPONENT: CAP MANUFACTURER: G080
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On April 9, 1990 at 1814 EDT, with Unit 4 in Mode 1 (Power Operation) at 100 percent power, a Reactor Protection System actuation occurred due to a failure of a Reactor Coolant Pump (RCP) underfrequency relay power supply capacitor.

The reactor trip occurred because one of three reactor coolant pump power supply breakers opened with the reactor at greater than 45 percent power. The faulty underfrequency relay was replaced and Unit 4 was returned to service. The RCP power supply underfrequency relays on both Unit 3 and Unit 4 have been replaced with new models. A review of the failure modes of the replacement relays will be performed and planned maintenance will be developed as appropriate.

On April 9, 1990, at 1914 EDT, a four hour report of the event was made to the NRC in accordance with 10 CFR 50.72.

END OF ABSTRACT

I. EVENT DESCRIPTION

On April 9, 1990 at 1814 Eastern Daylight Time (EDT), with Unit 4 in Mode 1 (Power Operations) at 100 percent power, a Reactor Protection System (EIIS:JC) actuation occurred causing a reactor trip. The trip was due to a failure of Reactor Coolant Pump underfrequency relay 4B2 (EIIS:AB Component:81). The underfrequency relay monitors the 4B 4160 volt bus (EIIS:EB Component:BU) for frequency and trips the 4B and 4C Reactor Coolant Pumps (EIIS:AB Component:P) when an underfrequency condition of 56.1 Hertz or less is sensed by one of two relays. Review of recorded frequency information indicated that no underfrequency condition existed at the time of the trip. The reactor trip occurred when of one of three reactor coolant pump breakers (EIIS:AB Component:BRK) opened with the reactor at greater than 45 percent power.

After the trip, pressurizer level declined to a level resulting in letdown isolation. Volume Control Tank (VCT) (EIIS:CB Component:TK) level declined to an indicated 5 percent level. As a result, the following occurred: Charging pump (EIIS:CB Component:P) "B" was started but tripped soon after starting. Charging pump suction did not switch automatically from the VCT to the Refueling Water Storage Tank (RWST) (EIIS:BP Component:TK). The transfer of charging pump suction from the VCT to the RWST was made manually. After a successful second attempt at starting the "B" charging pump, all three charging pumps were used to restore pressurizer level. Letdown was then restored. At 1845 EDT, with the unit stabilized in Mode 3 (Hot Shutdown), Control room personnel transferred from use of the Emergency Operating Procedures to General Operating Procedure 4-GOP-103, "Power Operation to Hot Standby."

At 1914 EDT, a four hour report of the event was made to the NRC in accordance with 10 CFR 50.72.

II. EVENT CAUSE

The cause of the trip was the internal failure of an underfrequency relay. A capacitor (EIIS:AB Component:CAP) in the relay's power supply failed causing the relay to change to the tripped position. This relay trip caused the trip of the supply breakers to the 4B and 4C Reactor Coolant Pumps which resulted in a Reactor Protection

System trip of the reactor.

III. EVENT SAFETY ANALYSIS

1. Reactor Trip

The failed underfrequency relay was part of a one out of two logic. If any of four underfrequency relays fail in a manner similar to that which occurred on April 9, the result is a reactor trip. A reactor trip from 100 percent power is a previously analyzed event. Since the reactor trip response occurred as designed, there was no impact on the health or safety of plant personnel or the general public.

2. Reduced Charging Flow.

Loss of charging flow is a previously analyzed event that is covered by Emergency Operating Procedures. In accordance with these procedures, the suction of the charging pumps was transferred from the VCT to the RWST. Charging was established and pressurizer program level was restored. Therefore there was no impact on the health or safety of plant personnel or the general public.

This Licensee Event Report is submitted in accordance with 10 CFR 50.73(a)(2)(iv).

IV. CORRECTIVE ACTIONS

1. Reactor Trip:

The failed General Electric model 12SFF18C1A undervoltage relay has been replaced with a newer model 12SFF31D1A. The installed model is no longer available. The new model is a direct replacement which can be installed into the original case. The 12SFF18C1A and 12SFF23C1A reactor coolant pump underfrequency relays have been replaced on both Unit 3 and 4 with new 12SFF31D1A
models. Due to apparent end-of-life internal component failure an appropriate maintenance program will be developed by September 1, 1990 to reduce the probability of relay or capacitor failure.

2. Reduced Charging Flow

The effected VCT level transmitter (LT) was repaired and LT 112 and 115 were recalibrated to provide for the automatic transfer of charging pump suction from the VCT to the RWST based upon low VCT level. Calibration of the Unit 3 VCT level transmitters was accomplished during the 1990 spring refueling outage. The root cause of this failure is under investigation. The evaluation will be complete and corrective action will be determined by July 15, 1990.

V. ADDITIONAL INFORMATION

1. Previous Events

Similar trips due to the malfunction of underfrequency relays have occurred at Turkey Point in the past. Three trips occurred in late 1978, two on Unit 3 and one on Unit 4. In all three cases no relay failure mode was found. At that time the three relays were replaced with newer models. Until the failure of the capacitor on April 9 the new models have exhibited no malfunction tendencies.

2. Component Failures

Underfrequency relay
Manufactured by General Electric
Model Number 12SFF18C1A

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P.O. Box 14000, Juno Beach, FL 33408-0420

FPL

MAY 08 1990

L-90-143
10 CFR 50.73

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Unit 4
Docket No. 50-251
Reportable Event: 90-003
Date of Event: April 9, 1990
Unit Trip Due to Underfrequency Relay Failure

The attached Licensee Event Report is being provided pursuant to the requirements of 10 CFR 50.73 for notification of the subject event.

Very truly yours,

K. N. Harris
Vice President
Turkey Point Plant Nuclear

KNH/DRP/JEK/rat

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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